



EOSDIS

NASA'S EARTH OBSERVING SYSTEM
DATA AND INFORMATION SYSTEM

Metadata Evaluation and Improvement: Evolving Analysis and Reporting

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A magnifying glass with a black handle and frame is positioned over a light blue background. The lens of the magnifying glass is centered on the word "ANALYSIS" in a bold, dark blue, sans-serif font. Above and below the word, there are faint, stylized representations of binary code (0s and 1s) in a light blue color, which are slightly blurred and appear to be part of a larger, repeating pattern. The magnifying glass's handle extends towards the bottom right corner of the image.

The collections we are analyzing are becoming more detailed
(CMR -> DAAC)
and
our tools are becoming more detailed and interactive

Table of Contents	
EXECUTIVE SUMMARY	1
UIMM COLLECTION: WHAT IS IT?	2
Recommendation/Dialect Expansion Report	3
RECOMMENDATION DIALECT COMPARISON - HOW DO MY DIALECTS FIT?	3
Recommendation/Dialect Mapping Graphs	4
Recommendation/Dialect Expansion Report	4
MISSING CONCEPTS REPORTS	6
Required UIMM Collection Concepts not included in DIF	6
Recommended UIMM Collection Concepts not included in ECHO	6
Recommended UIMM Collection Concepts not included in DIF	6
Optional UIMM Collection Concepts not included in ECHO	6
Optional UIMM Collection Concepts not included in DIF	6
METADATA ANALYSIS - HOW COMPLETE ARE MY METADATA?	7
ISO ANALYSIS	8
KQID ANALYSIS	10
DIFX ANALYSIS	12
DIF ANALYSIS	13
METADATA ANALYSIS - WHAT DO CONCEPTS ARE MISSING?	14
METADATA ANALYSIS - WHAT ECHO CONCEPTS ARE MISSING?	16
METADATA ANALYSIS - WHAT DIFX CONCEPTS ARE MISSING?	19
METADATA ANALYSIS - WHAT DIF CONCEPTS ARE MISSING?	22
SPECIFIC GUIDANCE - HOW DO I IMPROVE MY METADATA?	25
GLOSSARY	26
APPENDIX 1.0: HOW DO DIALECTS EVOLVE?	30
APPENDIX 2.0: HOW DOES METADATA EVOLVE?	32

Report (doc)

[EARTHDATA](#)
[Data Discovery](#)
[DMOs](#)
[Community](#)
[Science Descriptions](#)

[Earthdata Main](#)
[Databases](#)
[Forms](#)
[Catalogs](#)
[Glossary](#)
[Support](#)

Pages / NASA EO for ECOTRS

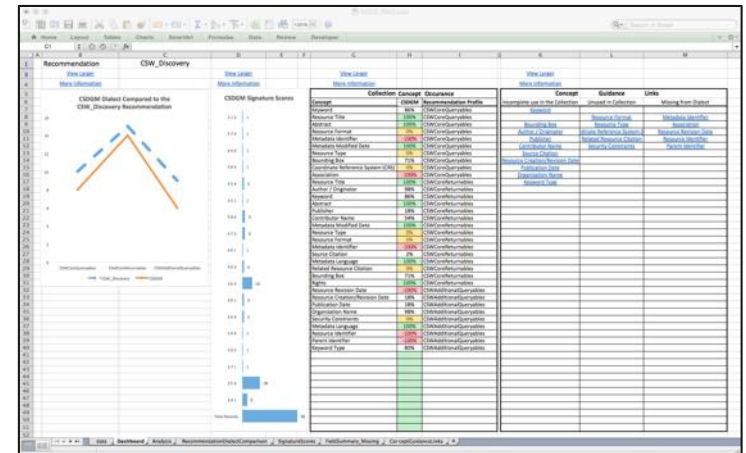
Citation Content in CMR Metadata

Created by John Kacmar, last modified by Russ Hogen on Oct 16, 2016

Resource Citations

Concept	Element Path	84	28	35	238	687	78
		AMR	CODES	GER_DISC	QVHC	GISCP4A	LAADS
Title	gmd:identificationInfo:ci:ciTitle	1.00	1.00	1.00	1.00	1.00	1.00
Date	gmd:identificationInfo:ci:ciDate:gmd:date	2.00	2.00	1.00	2.00	2.00	1.00
Date Type Code	gmd:identificationInfo:ci:ciDate:gmd:date:gmd:parentCI_DateTypeCode	2.00	2.00	1.00	2.00	2.00	1.00
Edition	gmd:identificationInfo:ci:ciEdition	1.00	1.00	1.00	1.00	1.00	1.00
Identifier	gmd:identificationInfo:ci:ciIdentifier:gmd:identifierCode	1.02	1.82	1.00	2.00	2.00	1.00
Identifier Description	gmd:identificationInfo:ci:ciIdentifier:gmd:identifierCode:gmd:description	1.27	1.82	1.00	2.00	2.00	1.00
Identifier Code Space	gmd:identificationInfo:ci:ciIdentifier:gmd:identifierCode:gmd:codeSpace	21	82		1.00	1.00	
Other Citation Details	gmd:identificationInfo:ci:ciOtherCitationDetails				21	1.00	
Phone	gmd:identificationInfo:ci:ciContactInfo:gmd:contactInfo:ci:ciPhone					86	
Address	gmd:identificationInfo:ci:ciContactInfo:gmd:contactInfo:ci:ciAddress					86	
Site Code	gmd:identificationInfo:ci:ciContactInfo:gmd:contactInfo:ci:ciSiteCode					87	
Organization Name	gmd:identificationInfo:ci:ciContactInfo:gmd:contactInfo:ci:ciOrganizationName						
Contact Instructions	gmd:identificationInfo:ci:ciContactInfo:gmd:contactInfo:ci:ciContactInstructions						
Individual Name	gmd:identificationInfo:ci:ciContactInfo:gmd:contactInfo:ci:ciIndividualName						87

Quick Evaluation (wiki)



Dashboard (excel)

Terminology

Collection: A group of metadata records, commonly organized by a data center, organization or project and often stored in a database or web accessible folder.

Concept : General term for describing a documentation entity (e.g. Title, Revision Date, Process Step, Spatial Extent).

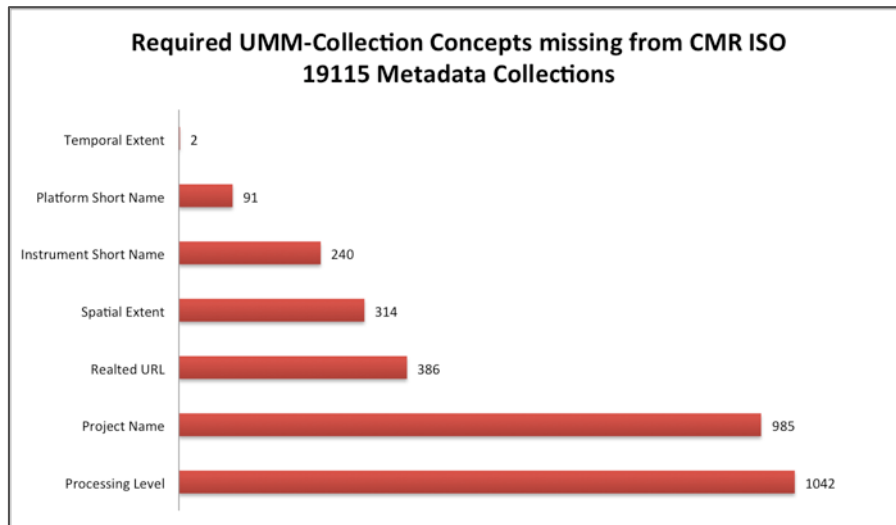
Dialect : A particular form of the documentation language that is specific to a community (e.g. DIF, CSDGM, EML, ECHO).

Recommendation: A set of concepts that a group believes is required for achieving a documentation goal.

Spiral: A set of concepts required to support a particular documentation need or use case for a recommendation.

Evaluation Report (i.e. Case-Study)

- Comprehensive completeness evaluation for **multiple dialects and recommendations**.
- Analyze complete metadata collections of any size. (no processing limitations).
- **Deliverable is a comprehensive report** which includes detailed analysis, supported by a variety of quantitative visualizations and a narrative interpretation of the results.
- Often includes an appendix with more detailed exploratory analysis.
- This report may take weeks to compile and draft. More comprehensive, but less agile than the RAD report.
- ESDIS reports covered the entire CMR collection – no differentiation by DAAC.



Results Summary Table - Percent of Records Missing Recommended Concepts				
CONCEPT	DIF	DIF10	ECHO	ISO19115
Purpose	0%	7%	88%	88%
Resource Language	100%	91%	*	0%
Resource Contact ₃	84%	84%	0%	9%
Responsibility	0%	0%	0%	0%
Collection Data Type ₄	95%	95%	95%	100%
Resource Citations ₅	0%	91%	0%	9%
Resource Status ₆	39%	39%	33%	42%
Quality Statement ₇	0%	5%	82%	84%
Resource Use Constraints ₈	0%	5%	62%	0%
Resource Access Constraints	100%	95%	0%	0%
Topic Category	100%	91%	*	100%
Media	100%	91%	*	100%
Resource Format	100%	91%	61%	61%
Transfer Size	100%	99%	*	100%
Resource Cost or Fees	100%	91%	48%	48%

Quick Evaluation Report

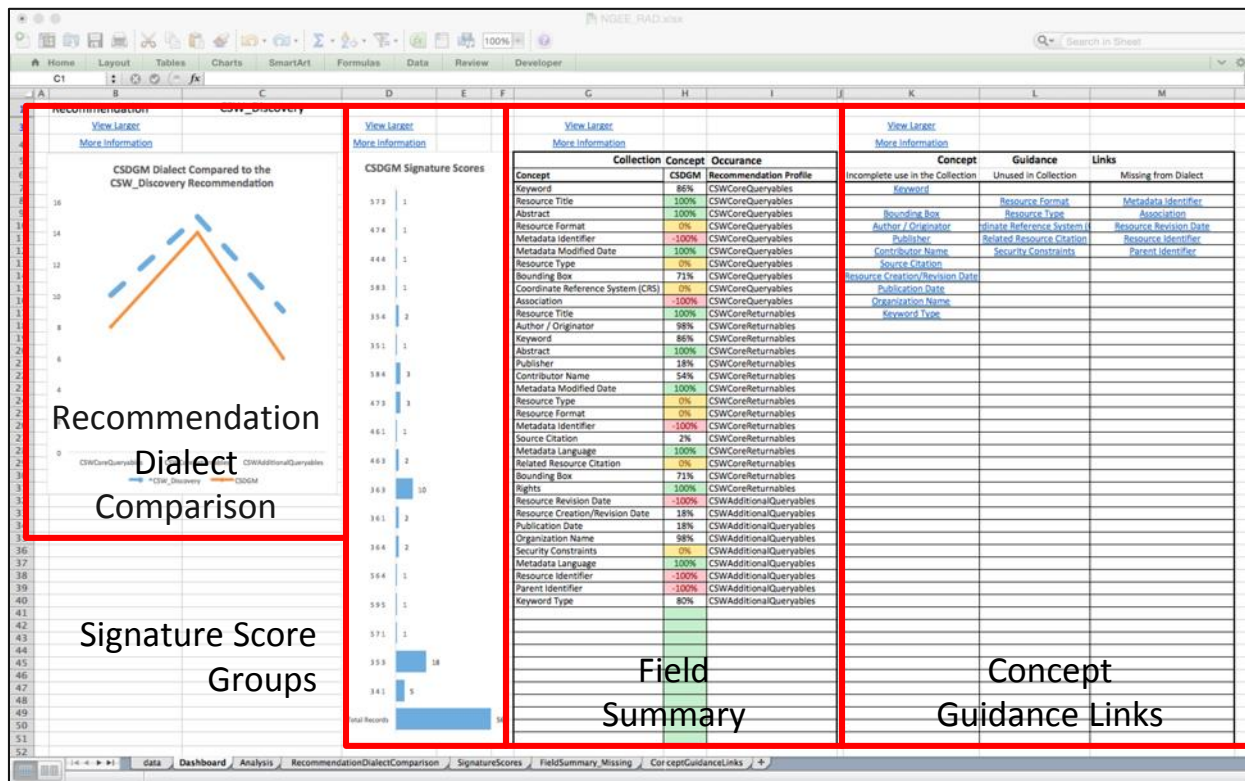
- Empirical analysis of fields (XML) used in metadata collections (**no recommendations**).
- Comparisons across collections (i.e. DAACs).
- Identifies fields organizations consider most important (bottom up - empirical approach).
- Detailed view of the metadata. All fields in an object are compared.
- See <https://wiki.earthdata.nasa.gov/display/NASAISO/NASA+ISO+for+EOSDIS>

Occurrences of Metadata Contact Responsibility

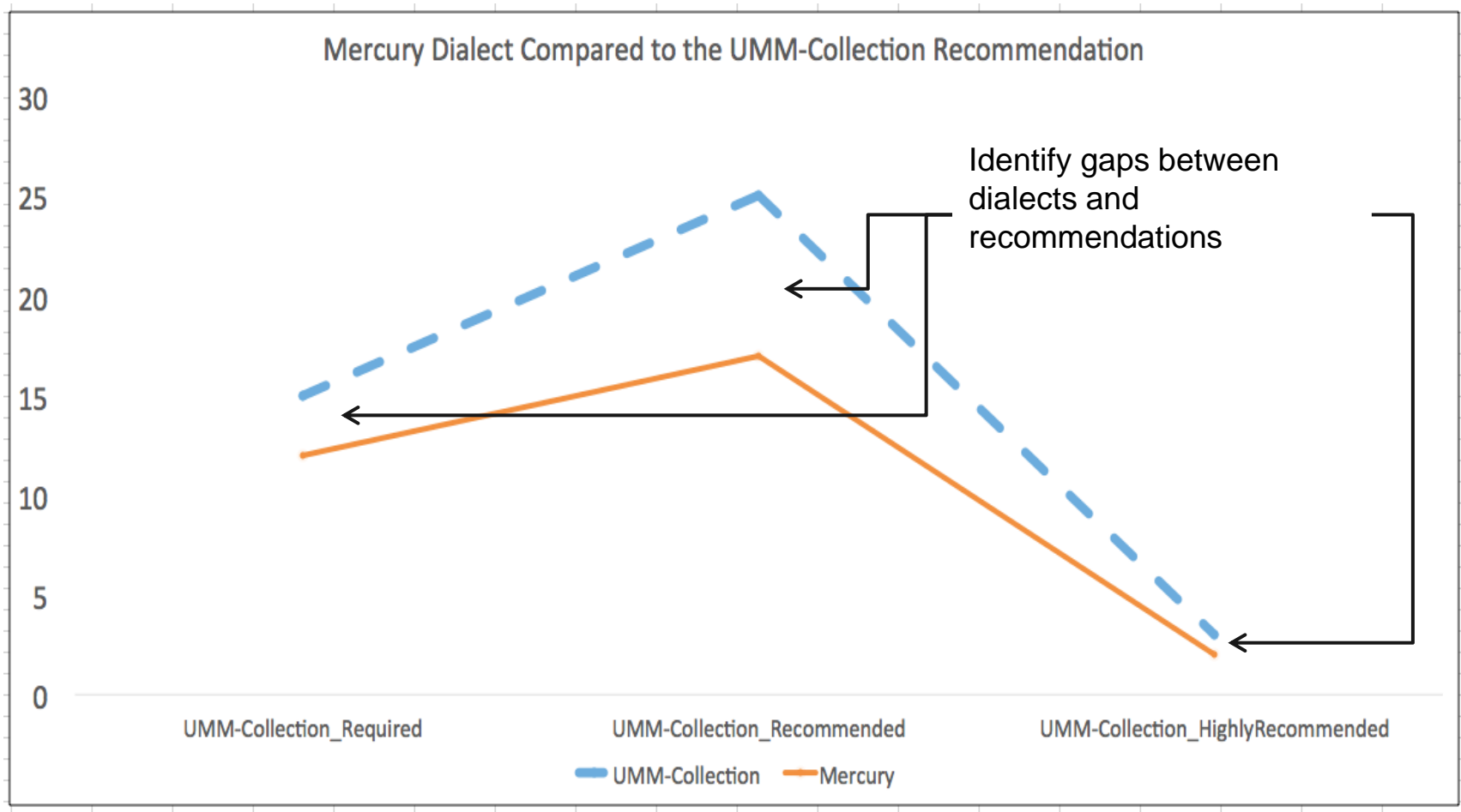
Number of Records		84	28	35	339	687	78	5	116	343	495	185	197	63	4	1135	375	11	
Concept	Platform Content in ISO Metadata																		
gmd:organisationName	Created by John Kazimor, last modified by Ross Bagwell about 6 hours ago																		
gmd:CI_RoleCode	Number of Records	32	36	267	491	53	43	319	134	164	280	77	68	973	80	170	11	2158	
gmd:individualName	Concept	Element Path	ASF	CDDIS	GHRC	GSFCS4PA	LAADS	LANCEMODIS	LARC	LARC_ASCD	LPDAAC_ECS	NSIDCV0	NSIDC_ECS	OBPG	ORNL_DAAC	PODAAC	SEDAC	USGS_EROS	# Collection
gmd:deliveryPoint	Platform ID	gmi:acquisitionInformation/gmi:platform/@id	1.00	7.14	1.27	.85	1.00	1.00	1.00	6.30	1.13	1.62	1.47	1.00	1.39	1.93		2.00	16
gmd:city	Platform Identifier Description	gmi:acquisitionInformation/gmi:platform/gmi:identifier/gmd:description	1.00	7.14	1.27	.85	1.00	1.00	1.00	6.30	1.13	1.62	1.47	1.00	1.39	1.93		2.00	16
	Platform Description	gmi:acquisitionInformation/gmi:platform/gmi:description	1.00	.06	1.27	.85	1.00	1.00	1.00	6.30	1.13	1.62	1.47	1.00	1.39	1.93		2.00	15
	Platform Identifier	gmi:acquisitionInformation/gmi:platform/gmi:identifier/gmd:code	1.00	7.14	1.27	.85	1.00	1.00	1.00	6.30	1.13	1.62	1.47	1.00	1.39	1.93		2.00	15
gmd:administrativeArea	Platform Additional Attribute Name	gmi:acquisitionInformation/gmi:platform/eos:otherProperty/gco:Record /eos:AdditionalAttributes/eos:AdditionalAttribute/eos:reference/eos:name				.24	.98	1.00	.75		1.07		1.99					2.00	7
	Platform Additional Attribute Code List	gmi:acquisitionInformation/gmi:platform/eos:otherProperty/gco:Record /eos:AdditionalAttributes/eos:AdditionalAttribute/eos:reference/eos:type/@codeList				.24	.98	1.00	.75		1.07		1.99					2.00	7
gmd:postalCode	Platform Additional Attribute Code List Value	gmi:acquisitionInformation/gmi:platform/eos:otherProperty/gco:Record /eos:AdditionalAttributes/eos:AdditionalAttribute/eos:reference/eos:type/@codeListValue				.24	.98	1.00	.75		1.07		1.99					2.00	7
gmd:country	Platform Additional Attribute Type Code	gmi:acquisitionInformation/gmi:platform/eos:otherProperty/gco:Record /eos:AdditionalAttributes/eos:AdditionalAttribute/eos:reference/eos:type /eos:EOS_AdditionalAttributeTypeCode				.24	.98	1.00	.75		1.07		1.99					2.00	7
gmd:voice	Platform Additional Attribute Value	gmi:acquisitionInformation/gmi:platform/eos:otherProperty/gco:Record /eos:AdditionalAttributes/eos:AdditionalAttribute/eos:value				.24	.98	1.00	.75		1.07		1.99					2.00	7
	Platform Other Record Type	gmi:acquisitionInformation/gmi:platform/eos:otherPropertyType/gco:RecordType				.05	.98	1.00	.33		1.07		.57					2.00	7
	Platform Other Record Reference	gmi:acquisitionInformation/gmi:platform/eos:otherPropertyType/gco:RecordType/@xlink:href				.05	.98	1.00	.33		1.07		.57					2.00	7
	Platform Additional Attribute Data Type Code List	gmi:acquisitionInformation/gmi:platform/eos:otherProperty/gco:Record /eos:AdditionalAttributes/eos:AdditionalAttribute/eos:reference/eos:dataType/@codeList					.98	1.00	.45		1.07		.88					2.00	6
	Platform Additional Attribute Data Type Code List Value	gmi:acquisitionInformation/gmi:platform/eos:otherProperty/gco:Record /eos:AdditionalAttributes/eos:AdditionalAttribute/eos:reference/eos:dataType /@codeListValue					.98	1.00	.45		1.07		.88					2.00	6
	Platform Additional Attribute Data Type Code	gmi:acquisitionInformation/gmi:platform/eos:otherProperty/gco:Record /eos:AdditionalAttributes/eos:AdditionalAttribute/eos:reference/eos:dataType /eos:EOS_AdditionalAttributeData TypeCode					.98	1.00	.45		1.07		.88					2.00	6
	Platform Additional Attribute Description	gmi:acquisitionInformation/gmi:platform/eos:otherProperty/gco:Record /eos:AdditionalAttributes/eos:AdditionalAttribute/eos:reference/eos:description					.98	1.00	.45		1.07		.88					2.00	6
	PlatformAdditionalAttribute Measurement Units	gmi:acquisitionInformation/gmi:platform/eos:otherProperty/gco:Record /eos:AdditionalAttributes/eos:AdditionalAttribute/eos:reference /eos:parameterUnitsOfMeasure					.98	1.00	.45		1.07		.88					2.00	6

Recommendations Analysis Dashboard

- Interactive exploratory **metadata concept** evaluation tool.
- Enables metadata for a single dialect to be easily evaluated using multiple recommendations (eg. CSW, DataCite).
- Designed to run on collections of ~100 metadata records (samples of collections).
- Provides a nice dashboard interface with 4 different displays.
- Requires a data sheet, created by HDF metadata team.



Recommendation / Dialect Comparison



Field Summary

Identify fields that are missing from dialect, missing from collection, complete, or partial

-100% = Concept Not in Dialect

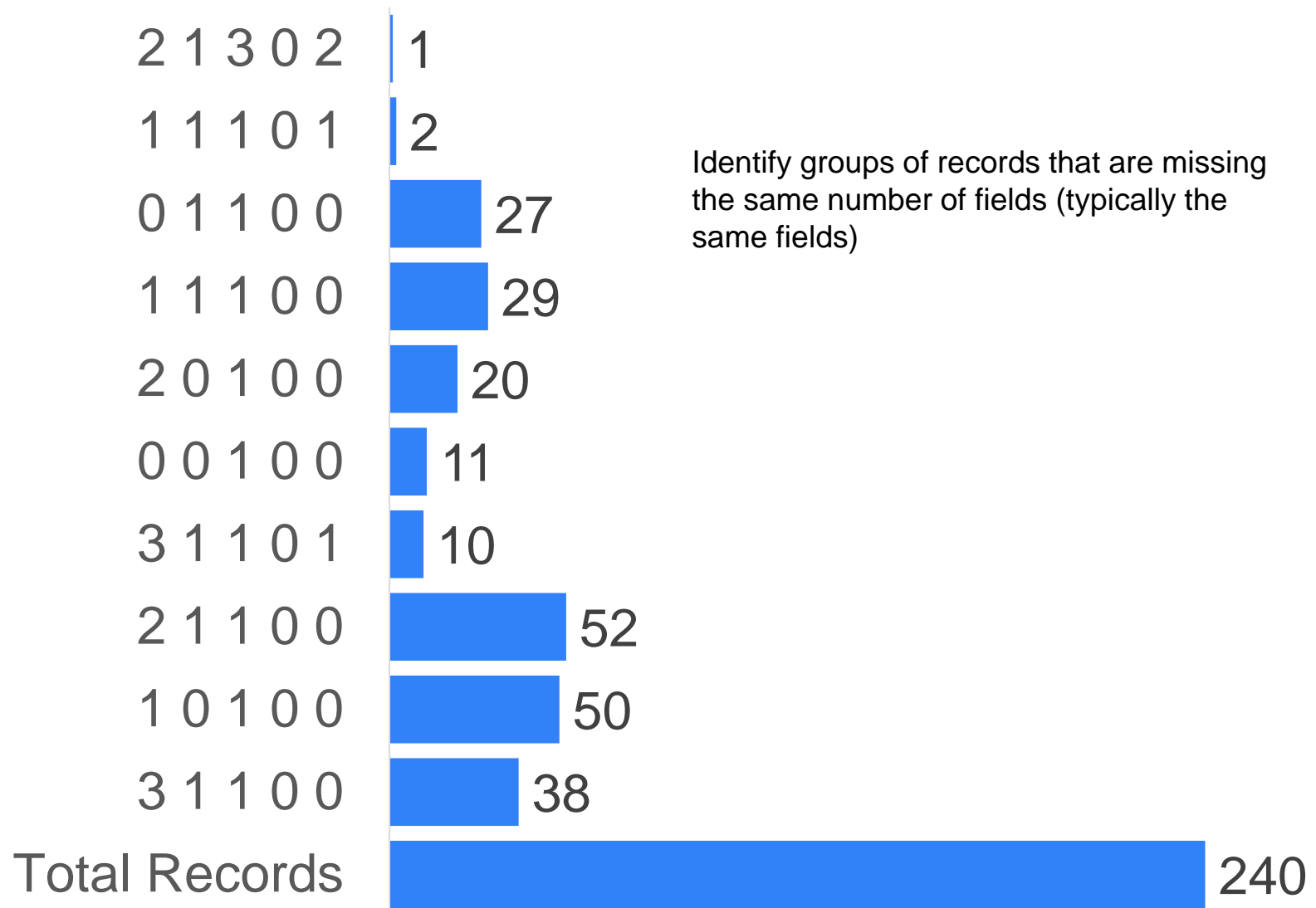
0% = Concept Not in Collection

100% = Concept in All Records

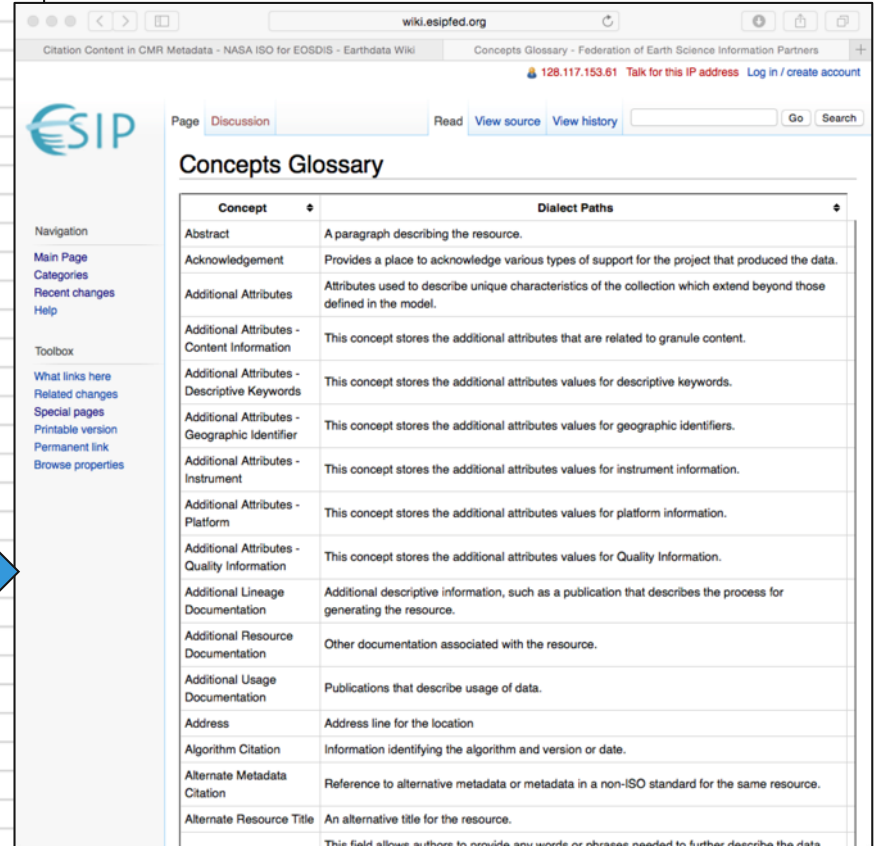
54% = Concept in Some Records

View Larger		
More Information		
Collection	Concept	Occurance
Concept	CSDGM	Recommendation Profile
Keyword	86%	CSWCoreQueryables
Resource Title	100%	CSWCoreQueryables
Abstract	100%	CSWCoreQueryables
Resource Format	0%	CSWCoreQueryables
Metadata Identifier	-100%	CSWCoreQueryables
Metadata Modified Date	100%	CSWCoreQueryables
Resource Type	0%	CSWCoreQueryables
Bounding Box	71%	CSWCoreQueryables
Coordinate Reference System (CRS)	0%	CSWCoreQueryables
Association	-100%	CSWCoreQueryables
Resource Title	100%	CSWCoreReturnables
Author / Originator	98%	CSWCoreReturnables
Keyword	86%	CSWCoreReturnables
Abstract	100%	CSWCoreReturnables
Publisher	18%	CSWCoreReturnables
Contributor Name	54%	CSWCoreReturnables
Metadata Modified Date	100%	CSWCoreReturnables
Resource Type	0%	CSWCoreReturnables
Resource Format	0%	CSWCoreReturnables
Metadata Identifier	-100%	CSWCoreReturnables
Source Citation	2%	CSWCoreReturnables
Metadata Language	100%	CSWCoreReturnables
Related Resource Citation	0%	CSWCoreReturnables
Bounding Box	71%	CSWCoreReturnables
Rights	100%	CSWCoreReturnables
Resource Revision Date	-100%	CSWAdditionalQueryables
Resource Creation/Revision Date	18%	CSWAdditionalQueryables
Publication Date	18%	CSWAdditionalQueryables
Organization Name	98%	CSWAdditionalQueryables
Security Constraints	0%	CSWAdditionalQueryables
Metadata Language	100%	CSWAdditionalQueryables

Signature Score Groups



Concept Guidance Links

[illegible]

Guidance Documentation

The image displays three overlapping screenshots of the wiki.esipfed.org website, illustrating guidance documentation for ESIP dialects.

Top Screenshot: Category: Documentation Connections

The top screenshot shows the "Category: Documentation Connections" page. It explains that the ESIP Community uses different documentation dialects (e.g. metadata models) to serve documentation needs for different systems and users. It mentions that there are many cross-cutting documentation concepts shared across these dialects, so there is no need for a single underlying documentation language. The page lists subcategories and provides a list of pages in the category "Documentation Connections", including "Big Earth Data Initiative", "Concepts Glossary", "Documentation Spirals", "Data Discovery (CSW)", "Data Discovery (DCAT)", "Data Discovery (ECS)", "Data Discovery (FGDC)", "Data Discovery (ISO-1)", "Data Provenance (ISO-1)", and "Data Quality (ISO-19157)".

Middle Screenshot: Documenting Browse Graphics

The middle screenshot shows the "Documenting Browse Graphics" page. It explains that browse graphics and other multimedia samples are important aids to data discovery and assessment and can also be used to create image links to resources. The page lists the common dialects that browse graphics in similar ways with names, URLs, file types and descriptions. It provides examples of XML code for documenting browse graphics, including the NASA GCMD Directory Interchange Format, ECHO, and ISO.

Bottom Screenshot: Content Standard for Digital Geospatial Metadata (FGDC)

The bottom screenshot shows the "Content Standard for Digital Geospatial Metadata (FGDC)" page. It provides a table of crosswalks between ESIP dialects and FGDC standards. The table has three columns: Concept, Description, and Dialect (File Paths). The concepts listed are Browse File Name, URL, Format, Caption, and Description. The descriptions provide details about the concept, and the dialect column lists the corresponding file paths for various ESIP dialects.

http://wiki.esipfed.org/index.php/Category:Documentation_Connections

Future Directions

- How do I identify which records are missing concepts?
- What concepts are missing in a single record?
- Signature Score Sprints

How do I identify which records are missing concepts?

Concept	Concept Dialect Definition Link	Record Name
Resource Format	Resource Format	oli_aeri.xml, oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsrl.xml
Coordinate Reference System (CRS)	Coordinate Reference System (CRS)	oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsrl.xml, oli_htdma.xml
Association	Association	oli_ghg.xml, oli_gndrad.xml, oli_hsrl.xml, oli_htdma.xml, oli_irt.xml, oli_kasacr.xml, oli_kazr.xml, oli_masc.xml, oli_maws.xml, oli_met.xml, oli_mfr.xml, oli_mfrsr.xml, oli_mpl.xml, oli_mplcmask.xml
Author / Originator	Author / Originator	oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsrl.xml, oli_htdma.xml, oli_irt.xml, oli_kasacr.xml, oli_kazr.xml, oli_masc.xml
Publisher	Publisher	oli_aeri.xml, oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsrl.xml
Contributor Name	Contributor Name	oli_aeri.xml, oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml
Source Citation	Source Citation	oli_aeri.xml, oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsrl.xml
Related Resource Citation	Related Resource Citation	oli_ghg.xml, oli_gndrad.xml, oli_hsrl.xml, oli_htdma.xml, oli_irt.xml, oli_kasacr.xml, oli_kazr.xml, oli_masc.xml, oli_maws.xml, oli_met.xml, oli_mfr.xml, oli_mfrsr.xml, oli_mpl.xml, oli_mplcmask.xml
Resource Creation/Revision Date	Resource Creation/Revision Date	oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsrl.xml, oli_htdma.xml, oli_irt.xml, oli_kasacr.xml, oli_kazr.xml, oli_masc.xml
Publication Date	Publication Date	oli_aeri.xml, oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsrl.xml
Security Constraints	Security Constraints	oli_aeri.xml, oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsrl.xml
Parent Identifier	Parent Identifier	oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsrl.xml, oli_htdma.xml

Links to xPaths in particular dialect

What concepts are missing in a single record?

Record Name ▼	Concept Links to Dialect Definitions ▼
oli_aeri.xml	Resource Format, Coordinate Reference System (CRS), Association
oli_amc.xml	Coordinate Reference System (CRS), Association, Author / Originator
oli_aod.xml	Association, Author / Originator, Publisher
oli_aos.xml	Author / Originator, Publisher, Contributor Name
oli_ceil.xml	Publisher, Contributor Name, Source Citation
oli_csapr.xml	Contributor Name, Source Citation, Related Resource Citation
oli_csphot.xml	Source Citation, Related Resource Citation, Resource Creation/Revision Date
oli_dl.xml	Related Resource Citation, Resource Creation/Revision Date, Publication Date
oli_dlprof.xml	Resource Creation/Revision Date, Publication Date, Security Constraints
oli_ecmwfdiag.xml	Publication Date, Security Constraints, Parent Identifier
oli_ecor.xml	Security Constraints, Parent Identifier,
oli_ghg.xml	Parent Identifier, ,

Signature Score Sprints

Signature Score Group ▼	Record Count ▼	Record Name ▼	Concept Links to Dialect Definitions ▼
0 0 3	54	oli_aeri.xml, oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsr.xml	Resource Format, Coordinate Reference System (CRS), Association
0 0 4	32	oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsr.xml, oli_htdma.xml	Coordinate Reference System (CRS), Association, Author / Originator
0 4 4	16	oli_ghg.xml, oli_gndrad.xml, oli_hsr.xml, oli_htdma.xml, oli_irt.xml, oli_kasacr.xml, oli_kazr.xml, oli_masc.xml, oli_maws.xml, oli_met.xml, oli_mfr.xml, oli_mfrsr.xml, oli_mpl.xml, oli_mplcmask.xml	Association, Author / Originator, Publisher
0 5 1	85	oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsr.xml, oli_htdma.xml, oli_irt.xml, oli_kasacr.xml, oli_kazr.xml, oli_masc.xml	Author / Originator, Publisher, Contributor Name
1 5 1	12	oli_aeri.xml, oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsr.xml	Publisher, Contributor Name, Source Citation
1 8 7	5	oli_aeri.xml, oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsr.xml	Contributor Name, Source Citation, Related Resource Citation
2 2 0	7	oli_amc.xml, oli_aod.xml, oli_aos.xml, oli_ceil.xml, oli_csapr.xml, oli_csphot.xml, oli_dl.xml, oli_dlprof.xml, oli_ecmwfdiag.xml, oli_ecor.xml, oli_ghg.xml, oli_gndrad.xml, oli_hsr.xml, oli_htdma.xml	Source Citation, Related Resource Citation, Resource Creation/Revision Date
3 0 0	2	oli_ghg.xml, oli_gndrad.xml, oli_hsr.xml, oli_htdma.xml, oli_irt.xml, oli_kasacr.xml, oli_kazr.xml, oli_masc.xml, oli_maws.xml, oli_met.xml, oli_mfr.xml, oli_mfrsr.xml, oli_mpl.xml, oli_mplcmask.xml	Related Resource Citation, Resource Creation/Revision Date, Publication Date

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Any opinions, findings, conclusions, or recommendations expressed in this material are those of the author and do not necessarily reflect the views of NASA or The HDF Group.



The HDF Group